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Test Plan for EAC VVSG 1.1 Certification Testing

Everyone Counts eLect Quad Audit v.4.3.0

EAC Project ID: ECI1502

Version: Initial Release

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U.S. Election Assistance Commission

VSTL

EAC Lab Code 1501

NVLAP[®]

NVLAP LAB CODE 200908-0

SIGNATURES

Approved by:

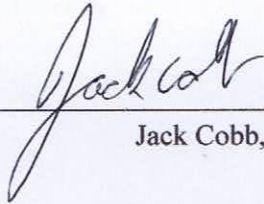


for Michael Walker, VSTL Project Manager

6/6/16

Date

Approved by:



Jack Cobb, Laboratory Director

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Date

REVISIONS

Revision	Description	Date
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1.0 INTRODUCTION

The purpose of this Test Plan is to document the procedures that Pro V&V, Inc. will follow to perform certification testing of the Everyone Counts eLect Quad Audit v.4.3.0 to the requirements set forth by voting systems in the U.S. Election Assistance Commission (EAC) 2015 Voluntary Voting System Guidelines (VVSG) Version 1.1. Prior to submitting the voting system for testing, Everyone Counts submitted an application package to the EAC for certification of the elect Quad Audit v.4.3.0 to the requirements of the EAC VVSG Version 1.1. The application was accepted by the EAC and assigned the unique application number of ECI1502. In the application, Everyone Counts selected Pro V&V as the lead VSTL for the test engagement.

Pro V&V received its Voting System Testing Accreditation from The National Institute of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) on April 2, 2012 for core test methods. Additionally, Pro V&V was audited by the Election Assistance Commission (EAC) and successfully met all requirements for the EAC Voting System Testing Laboratory (VSTL) accreditation. As a result, Pro V&V was granted accreditation as a VSTL on February 24, 2015.

At test conclusion, the results of all testing performed as part of this test campaign will be submitted to the EAC in the form of a final report.

The implementation statement provided by the manufacturer for this test campaign is provided in Attachment A.

1.1 References

This subsection lists all documents relevant to the preparation of this Test Plan.

- Election Assistance Commission 2015 Voluntary Voting System Guidelines (VVSG) Version 1.1, Volume I, "Voting System Performance Guidelines", and Volume II, "National Certification Testing Guidelines"
- Election Assistance Commission Testing and Certification Program Manual, Version 2.0
- Election Assistance Commission Voting System Test Laboratory Program Manual, Version 2.0
- National Voluntary Laboratory Accreditation Program NIST Handbook 150, 2006 Edition, "NVLAP Procedures and General Requirements (NIST Handbook 150)", dated February 2006
- National Voluntary Laboratory Accreditation Program NIST Handbook 150-22, 2008 Edition, "Voting System Testing (NIST Handbook 150-22)", dated May 2008
- United States 107th Congress Help America Vote Act (HAVA) of 2002 (Public Law 107-252), dated October 2002
- Pro V&V, Inc. Quality Assurance Manual, Version 7.0
- Election Assistance Commission "Approval of Voting System Testing Application Package" letter dated November 12, 2015

- EAC Requests for Interpretation (RFI) (listed on www.eac.gov)
- EAC Notices of Clarification (NOC) (listed on www.eac.gov)
- Everyone Counts eLect Quad Audit v.4.3.0 Technical Data Package (*A listing of the eLect Quad Audit v.4.3.0 documents submitted for this test campaign is listed in Section 4.6 of this Test Plan*)

1.2 Terms, Abbreviations, and Definitions

This subsection lists terms and abbreviations relevant to the hardware, the software, or this Test Plan.

“ADA” – Americans with Disabilities Act 1990

“CM” – Configuration Management

“COTS” – Commercial Off-The-Shelf

“EAC” – United States Election Assistance Commission

“EAC VVSG 1.1” – United States Election Assistance Commission 2015 Voluntary Voting System Guidelines, Version 1.1

“EBM” – Electronic Ballot Marker

“EOC” – Everyone Counts

“EMS” – Election Management System

“FCA” – Functional Configuration Audit

“HAVA” – Help America Vote Act

“MPSM” – Master Poll Station Machine

“NIST” – National Institute of Standards and Technology

“NOC” – Notice of Clarification

“PCA” – Physical Configuration Audit

“QA” – Quality Assurance

“RFI” – Request for Interpretation

“TDP” – Technical Data Package

“UPS” – Uninterruptible Power Supply

“NVLAP” – National Voluntary Laboratory Accreditation Program

“VSTL” – Voting System Test Laboratory

“VVSG” – Voluntary Voting Systems Guidelines

1.3 Testing Responsibilities

All testing will be conducted under the guidance of personnel verified by Pro V&V, Inc. to be qualified to perform the testing.

1.3.1 Project Schedule

The Project Schedule for the test campaign is located in Appendix A – Project Schedule. The dates on the schedule are not firm dates but planned estimates based on the anticipated project work flow.

1.3.1.1 Owner Assignments

This information is contained in the Project Schedule presented in Appendix A.

1.3.1.2 Test Case Development

Pro V&V will utilize baseline test cases for the Functional Configuration Audit (FCA), Usability, and System Integration Tests. These test cases will be augmented with specially designed test cases tailored to the specific design of the eLect Quad Audit v.4.3.0. Additionally, specific election definitions will be designed for the Operational Status Check and the Logic & Accuracy Tests.

1.3.1.3 Test Procedure Development and Validation

Pro V&V will utilize VSTL Test Procedures during the duration of the test campaign. These procedures are developed to the EAC 2015 VVSG 1.1 standards. The validation of the VSTL Test Procedures is accomplished by Technical Review and Approval. If necessary and where practical, a validation might include execution to attempt to achieve the expected results using the selected tool of the testing methodology. Test Plans, Test Suites, Test Specifications, and Test Cases will be validated prior to execution. This validation will include the following:

- Confirmation of adequate test coverage of all requirements.
- Confirmation that test case results are not ambiguous and have objective pass/fail criteria.
- Confirmation that any automated test suites will produce valid results.

1.3.1.4 Third Party Tests

Pro V&V will be utilizing third party testing during the performance of the product safety and hardware testing. This testing will be witnessed by Pro V&V personnel at the third party test site.

1.3.1.5 EAC and Manufacturing Dependencies

This information is contained in the Project Schedule presented in Appendix A.

1.4 Target of Evaluation Description

The following sections contain a product description and an overview of the design methodology of the eLect Quad Audit v.4.3.0 Voting System, as taken from the Everyone Counts technical documentation.

1.4.1 System Overview

The eLect Quad Audit 4.3.0 System is a voting system encompassing all aspects of election management, including election definition and configuration, ballot creation, voting, data transmission, vote data management, reporting, and auditing. The eLect Quad Audit 4.3.0 incorporates polling location ballot delivery, ballot marking, vote capture, and vote storage capabilities that operate on commercial off-the-shelf (COTS) hardware.

The eLect Quad Audit 4.3.0 System consists of the major components listed below:

Software Components:

eLect Quad Audit

The eLect Quad Audit is the software platform that provides election administrators with the tools to manage elections. The software is accessed by means of COTS hardware devices. The eLect Quad Audit user interface (the EMS) is called eLect Administration and it includes the following:

- eLect Central Scanning module
- eLect Quad Audit Voting module
- eLect Security Suite utility application

eLect Administration

The eLect Administration dashboard is the voting system's user interface for the Admin User. It contains the various system modules for all aspects of election creation and management. eLect Administration is used by election administrators to define election criteria, create and set up an election configuration, create ballots, generate reports, and manage the election life cycle.

eLect Security Suite

eLect Security Suite is a utility application that provides encryption and decryption services. There are two modes of operation:

1. Standalone - runs as a desktop application on the eLect Quad Audit solution's AirGapped Machine. The election official/administrator creates public and private security keys for vote data encryption in the system.
2. Embedded - The automated utility is directly called by eLect Quad Audit to encrypt cast ballots during the voting session and decrypt encrypted ballots after the voting session

eLect Quad Audit Voting

The eLect Quad Audit voting module is the core software module of the voting system. A voting session is initiated at the EBM once the QR code is scanned; the voter is then served the assigned ballot style. Ballot submissions are saved, transmitted, confirmed, scanned, encrypted, and stored in the Master Poll Station Machine (MPSM) database.

eLect Central Scanning

eLect Central Scanning is a scanning and imaging module incorporated within eLect Administration. eLect Central Scanning supports write-in ballot scanning, imaging and adjudication processes.

eLect Poll Station Management Console

The eLect Poll Station Management Console is the user interface that poll workers access through the Poll Station EBM.

Hardware Components:

Central Server

The Central Server is the server hosting eLect Administration, the EMS, and all centralized eLect Quad Audit voting system software. All election settings generated on the Central Server are replicated to each MPSM for poll station voting prior to delivery of poll station equipment. At the end of the election day, the data on the MPSM is then copied back into the Central Server for aggregated tabulation.

eLect Administration Access Machine

The eLect Administration Access Machine is the laptop providing access to the eLect Administration, the user interface for all election management functionality in the eLect Quad Audit voting system. It also provides access to the Central Scanning module in eLect Administration for scanning ballots accepted in the Central Office.

Air-Gapped Machine

The Air-Gapped Machine is the laptop that runs the eLect Security Suite and encrypts and decrypts user credentials, election keys, and vote data.

Imaging Server

The Imaging Server reads and verifies ballot markings after ballot scanning, during simultaneous processing in the batch manager. All vote data is then sent and stored on the Central Server database.

Central Scanner

The Central Scanner is the central location scanner for scanning all ballots received in the Central Office.

Master Poll Station Machine (MPSM)

The MPSM is the laptop that runs the voting session in each poll station. The Central Server's election configuration is replicated to each MPSM unit before equipment delivery to the Poll Stations. The MPSM then runs the election and transmits data to and from the EBMs using a wired network connection. Each MPSM server is uniquely identified during initial setup from the EMS when the election is deployed from the Central Server. The MPSM replicates vote data to the Central Server after the close of the polls.

Electronic Ballot Marker (EBM)

The EBM is a tablet that is enclosed in a secure, locking enclosure. It can also be attached to various voting accessibility peripherals. The EBM is connected to the MPSM to display the ballot with marking capabilities. No vote or system data is stored on the EBM.

Ballot Box Scanner

The Ballot Box Scanner is the entry access control point for ballots to be submitted into the Ballot Box. No election settings or ballot/vote data is stored on the Ballot Box scanner. The scanner collects the Poll Station QR code data and transfers the data back to the MPSM. If the ballot data is successfully verified at the MPSM, a signal is sent back to the Scanner to pull the ballot fully into the secured Ballot Box container. If the ballot is not verified by the system as valid, the paper is ejected from the scanner and returned to the voter.

The follow tables provide the software and hardware components of the eLect Quad Audit 4.3.0 System to be tested, identified with version numbers.

Table 2-2: Firmware/Software Versions

eLect Quad Audit 4.3.0ds System Component	Version
eLect Quad Audit	TBD
eLect Administration	TBD
eLect Poll Station Management Console	TBD
eLect Central Scanning	1.1
eLect Quad Audit Voting Module	TBD
eLect Security Suite	1.3.0

Table 2-3: Hardware Versions

eLect Quad Audit 4.3.0ds System Component	Hardware Component
Central Server	SuperMicro SC813MTQ-R400CB
eLect Administration Access Machine	Dell Latitude E5450/5450
Air-Gapped Machine	Dell Latitude 14 5000 Series (E5450) Laptop
Imaging Server	SuperMicro SC813MTQ-R400CB; i4250, i3400, and i2820 Kodak Scanners
Central Scanner	i4250, i3400, and i2820 Kodak Scanners
Master Poll Station Machine	Dell Latitude 14 5000 Series (E5450) Laptop
Electronic Ballot Marker (EBM)	Dell Venue Pro 11 Tablet Model 5130; Canon PIXMA iP110 (report printer)

1.4.2 Block Diagram

The following diagram provides an overview of the eLect Quad Audit system operations:

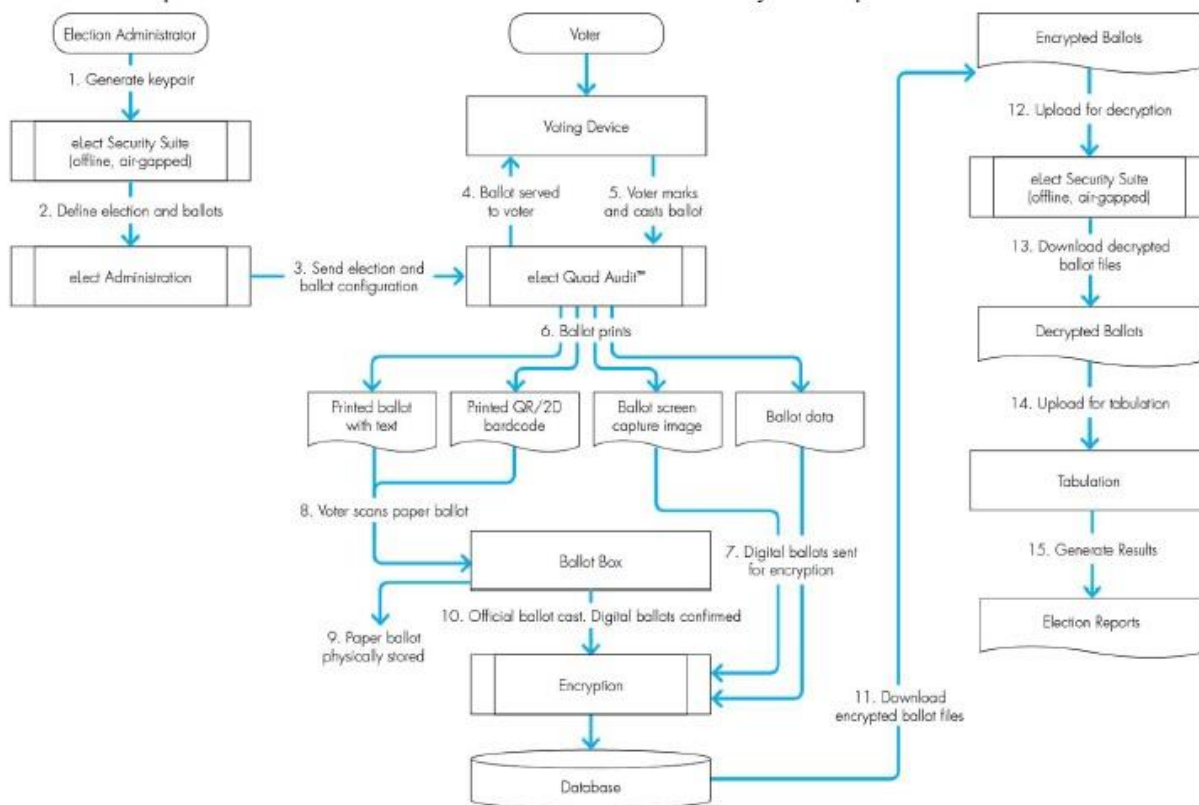


Figure 1.4.2-1: eLect Quad Audit System Operations Overview

1.4.3 System Limits

The system limits that Everyone Counts has stated to be supported by the eLect Quad Audit v.4.3.0 are listed in the table below.

Table 1-1. System Limits

Device/Component	Limits
eLect Administration	Candidate names: A limit of 100 characters per candidate name applies. Lengthy candidate names limit ballot style configuration. To accommodate this limitation, users should adjust the candidate name length. Visual inspection and confirmation to verify this is performed during the ballot configuration process on both the digital ballots and the mail-in paper ballots.
Central Server	<ul style="list-style-type: none"> Active Elections: The Central Server has the capability to run one active election. The Central Server cannot run multiple elections.

	<ul style="list-style-type: none"> Name cannot exceed a maximum of two (2) digits when naming the Central Server: For example, c01, c20, c99 are acceptable
Master Poll Station Machine	<ul style="list-style-type: none"> Cannot alter election data after the configuration is defined and pulled from the Central Server. Cannot exceed a maximum of 1000 devices names Cannot exceed a maximum of two mpsm (2) digits when naming the MPSM after naming the central with two (2) digits: For example, cXXpsYY.
Electronic Ballot Marker (EBM)	<ul style="list-style-type: none"> Cannot store any election data on device Cannot display the ballot without connection to MPSM Cannot mark the ballot without connection to MPSM Cannot review the ballot without connection to MPSM Cannot alter any election data or settings beyond a single ballot voting session
EBM Printer Paper Limits	<p>Paper Size: US Standard 8.5x11 inches</p> <p>Paper Color: White</p> <p>Paper Weight: 20 lb minimum to 24 lb maximum</p> <p>Capacity: 50 sheets in feeder tray</p>
Ballot Box Limits	<ul style="list-style-type: none"> Cannot reverse roll a paper ballot once accepted from the ballot box scanner Does not maintain the ballot counter without connection to MPSM (maintained on the MPSM, and displays on ballot box display screen) Does not store election data or vote data on the device Cannot operate as a ballot box without connection to the MPSM
Central Scan Paper Ballot Limits	<p>Paper Size in inches:</p> <ul style="list-style-type: none"> U.S. Letter (8.5 x 11) U.S. Legal (8.5 x 14) U.S. Ledger (11 x 17) not supported by the Kodak i2820 scanner <p>Paper Color: White</p> <p>Paper Weight: 20 lb minimum to 24 lb maximum</p> <p>Printing Accuracy:</p> <p>Anchors are expected to be 5mm from the edge of the paper. The system can manage an error of +/-10 mm, and automatically scales the scanned images. It is recommended not to exceed an error of more than +/-5mm.</p>

Table 1-1. System Limits *(continued)*

Device/Component	Limits
Central Scan Limits	<ul style="list-style-type: none">Depending on the size of the scanner, Central Scan supports maximum batch sizes of up to 500 ballots, and deck loads of 100 sheets or less on the scanner. Batches can be paused between scanner reloads, when image processing continues for the batch, allowing for the display of scanned images to be added to the images in the batch.Additionally, in the creation of the paper ballot, it is important to note that every candidate name and contest name must be uniquely different from all others on the ballot or in the election. For example, if two candidates each have the name John Smith, a differentiator such as middle initial, party affiliation, etc., must be placed with the candidate name to ensure the proper display of tabulation results at the close of the election.
Ballot Pens	<p>Recommended and tested ballot pens for optimal scanning and imaging include:</p> <ul style="list-style-type: none">Pilot Precise V7 Rolling Ball Point Pens Black 0.7mmPapermate InkJoy 300 Ballpoint Pens Black 0.7mm

1.4.4 Supported Languages

The following languages have been stated by Everyone Counts to be supported by the eLect Quad Audit v.4.3.0:

- English
- Spanish
- Bengali
- Non-written language audio support

All stated languages will be verified to be supported; however, only English and Spanish ballots will be cast during functional testing. The accuracy of the translations between languages will not be verified.

1.4.5 Supported Functionality

The eLect Quad Audit v.4.3.0 is designed to support the following voting variations:

- General Elections
- Closed Primary
- Open Primary
- Early Voting
- Partisan/Non-Partisan Offices
- Write-In Voting

- Primary Presidential Delegation Nominations
- Straight Party Voting
- Split Precincts
- Vote for N of M
- Ballot Rotation
 - By Precinct
 - Weighted by Number of Registered Voters per Precinct
- Cumulative Voting
- Provisional or Challenged Ballots

As stated in the Implementation Statement, the eLect Quad Audit v.4.3.0 does not include support for Ranked Order Voting, Cross-party Endorsement, Recall Issues with options, or Proportional Representation.

1.4.5.1 Standard (VVSG) Functionality

The eLect Quad Audit v.4.3.0 will be evaluated to all applicable EAC 2015 VVSG 1.1 requirements.

1.4.5.2 Manufacturer Extensions

There are no manufacturer extensions on testing for this test campaign.

2.0 Pre-Certification Testing and Issues

The following pre-certification testing has been performed on an “At-Risk” basis:

Source Code Review

A first pass review has been performed for all source code submitted by Everyone Counts for the eLect Quad Audit v.4.3.0. Any issues discovered were compiled and reported to Everyone Counts for resolution. Subsequent submissions will be reviewed by comparing newly submitted code against previously reviewed code to ensure all documented issues are resolved.

Technical Data Package (TDP) Review

An initial TDP review was performed on the documents submitted for this test campaign. The initial review is an abbreviated review performed in order to determine if the documents contain sufficient information. It was determined that various documents were lacking in information. Additionally, inconsistencies were noted throughout the TDP package. The results of the review were reported to Everyone Counts for resolution. Everyone Counts has subsequently revised and resubmitted the TDP and Pro V&V is currently reviewing these submissions. Specific documents have been reviewed multiple times in order to facilitate performance of the FCA. The findings of each review performed are tracked in the TDP review spreadsheet.

Physical Configuration Audit (PCA)

An initial PCA has been performed to baseline the system prior to test campaign commencement. The PCA was performed by documenting each hardware and software component of the voting system by name, model, serial number, major component, and any other relevant information needed for identification. Photographs of each hardware component were also taken.

Functional Configuration Audit (FCA)

Pro V&V has begun conducting the FCA for the eLect Quad Audit v.4.3.0. This includes multiple reviews of specific TDP documents to clarify and expand upon information concerning the system functions and design methodology. During the FCA, assigned test personnel mapped the voting system functional options, input data to exercise all system functions, and took note of all program logic and data processing errors (this step will be performed throughout the test campaign in parallel with other examinations as long as all functions are exercised and independently tracked). Assigned test personnel also reviewed the requirements matrix for completeness, developed and performed system-specific Test Cases for any functions not exercised during other areas of the test campaign or for functions judged to need individual examination, reviewed the manufacturer's test procedures and test results to determine if the voting systems functional capabilities have been adequately tested, and analyzed the results of all testing and verify that all functionality and requirements not satisfied during previous testing have been met.

For the FCA, Test Suites are developed to cover the pre-voting, voting, and post-voting phases of the election process including the usability of the system during each phase.

2.1 Evaluation of Prior VSTL Testing

The eLect Quad Audit v.4.3.0 is a new voting system that has not previously been tested to applicable federal standards in the EAC Program.

2.2 Evaluation of Prior Non-VSTL Testing

Everyone Counts submitted the following summative usability report for review: "Usability Test Report of eLect Quad Audit v. 4.3.0 with 53 Voter Participants and 16 Poll Worker Participants for Requirement VVSG 1.1 Volume I, Section 3, and Volume 2, Section 7" prepared by Mile7, dated November 2, 2015.

2.3 Known Field Issues

This system has never been fielded; therefore, there are no known field issues to consider.

3.0 Materials Required for Testing

The following sections list all materials needed to enable the test engagement to occur.

The materials required for testing of the eLect Quad Audit v.4.3.0 include all materials to enable the test campaign to occur. This includes the applicable software and equipment as well as the TDP, test support materials, and deliverable materials.

3.1 Software

This subsection lists the proprietary and COTS software to be provided by the manufacturer as part of the test campaign. This includes all software required for the performance of hardware, software, telecommunications, security, and system integration tests.

Table 3-1. Voting System Software

Firmware/Software	Manufacturer	Version
Air-Gapped Machine		
OS: Ubuntu	Canonical	12.04.5 LTS
eLect Security Suite (Stand Alone)	Everyone Counts	1.3.0
Chef	Chef	12.4.3
NodeJS	Node.js Foundation	v4.2.3
OpenSSL	The OpenSSL Project	OpenSSL 1.0.1p-fips 9 Jul 2015
Central Server		
OS: Ubuntu	Canonical	12.04.5 LTS
eLect Security Suite (Embedded)	Everyone Counts	1.3.0
eLect	Everyone Counts	TBD
eLect Admin	Everyone Counts	TBD
MariaDB	MariaDB Corp.	10.0.25
Tomcat	Apache	6.0.35
Apache Webserver	Apache	2.2.22
Perl	Perl	5.14.2
Chef	Chef	12.4.3
Java	Oracle	1.8.0_65
LAME	LAME	3.99.3
Festival	N/A	2.1
eLect Administration Access Machine		
OS: Windows	Microsoft	8.1 Pro (64 bit)
Dynamic Web TWAIN HTML5 edition	Dynamsoft	10.2.312
eLect Secure Transfer Installer	Everyone Counts	1.1.2
Chrome	Google	47.0.2526.106
iP110 Printer Driver	Canon	6.3.9600.16384
Management Engine Components	Intel	10.0.30.1060
Network Connections Drivers	Intel	19.2

Table 3-1. Voting System Software *(continued)*

Firmware/Software	Manufacturer	Version
Kodak i4250 Driver	Kodak	1.2
Kodak i3400 Driver	Kodak	3.0
Kodak i2820 Driver	Kodak	4.5
E5450 Drivers: Chipset Driver	Dell	Chipset_Driver_YV GN8_WN_ 10.0.30.1060_A01.E XE
E5450 BIOS	Dell	A12
Central Scan Imagine Server		
OS: Windows	Microsoft	8.1 Pro (64 bit)
Visual C++ 2005 Redistributable KB246775	Microsoft	8.0.51011
Visual C++ 2010 x86 Redistributable	Microsoft	10.0.30319
Microsoft.NET Framework	Microsoft	v4.0.30319
Recostar	OpenText	7.0.2
Recostar Patch MSP, Service Pack 1	OpenText	revision #: {7F534C39-D036- 42A1-BF60- 12971ACF811C}
E1C eLect Central Scanning: Imaging Service exe	Everyone Counts	1.1
Power Chute Business Edition Agent	Schneider Electric	9.1.1.604
Local GPO	Microsoft	3.0.60.0
Enhanced Mitigation Experience Toolkit	Microsoft	5.2
MPSM		
OS: Ubuntu	Canonical	12.04.5 LTS
eLect Security Suite	Everyone Counts	1.3.0
eLect	Everyone Counts	TBD
Apache Webserver	Apache	2.2.22
Perl	Perl	5.14.2
Chef	Chef	12.4.3
Java	Oracle	1.8.0_65
MariaDB	MariaDB Corp	10.0.25
LAME	LAME	3.99.3
Festival	---	2.1

Table 3-1. Voting System Software *(continued)*

Firmware/Software	Manufacturer	Version
EBM		
OS: Windows	Microsoft	8.1 Pro (64 bit)
5130 Chipset Driver	Dell	603.9600.1948.3494 4
Dell System BIOS update	Dell	A04
Chrome	Google	47.0.2526.106
i110 Printer Driver	Cannon	6.3.9600.16384
EMET	Microsoft	5.2
Local GPO	Microsoft	3.0.60.0
Intel Graphics Driver	Intel	10.18.10.4176
JoyToKey	JoyToKey	5.7
Ballot Box Scanner		
OS: Windows	Microsoft	Microsoft Windows Embedded 8.1 Industry Pro 6.3.9600 Build 9600
Google Chrome	Google	47.0.2526.106
Everyone Counts Ballot Box Software	Everyone Counts	1.0.0
Twain	TWAIN Working Group	1.0.5
Pillow	PIL: Python Imaging Library	2.7.0
Python	Python software foundation	2.7.10150
zbar	Licensed under the GNU Lesser General Public License	0.10

3.2 Equipment

This subsection lists the proprietary and COTS equipment to be provided by the manufacturer as part of the test campaign. This includes all equipment required for the performance of hardware, software, telecommunications, security, and system integration tests.

For COTS equipment, every effort will be made to verify that the COTS equipment has not been modified for use. This will be accomplished by performing research using the COTS equipment manufacturer's websites based on the serial numbers and service tag numbers for each piece of equipment. Assigned test personnel will evaluate COTS hardware, system software and communications components for proven performance in commercial applications other than voting. For PCs, laptops, and servers, the service tag information will be compared to the system information found on each machine. Physical external and internal examination will also be performed when the equipment is easily accessible without the possibility of damage. Hard drives, RAM memory, and other components will be examined to verify that the components match the information found on the COTS equipment manufacturers' websites.

Table 3-2. Voting System Equipment

Component	Manufacturer	Model #
Air-Gapped Machine		
Dell Latitude E5450/5450	Dell	E5450
Removable Storage Device: 64GB PNY USB Flash Drive	PNY	P-FD64GTBOPGE
Central Server		
SuperMicro SC813MTQ-R400CB	SuperMicro	SC813MTQ-R400CB
APC Smart-UPS 1000 Watts/1500VA LCD 230V	APC	SMC1500
NETGEAR ProSAFE 16-Port Gigabit Ethernet Switch (GS116)	Netgear	GS116NA
Eaton 5S700 UPS	Eaton	5S700
Monitor Dell SE2416HX 23.8" Screen LED-Lit IPS Monitor	Dell	SE2416HX
Keyboard	Logitech	MK120
Mouse	Logitech	MK120
Cat6 Ethernet Cable 10'	N/A	N/A
Removable Storage Device: Patriot VEX 128GB USB Flash Drive	Patriot	PSF128GVEX3 USB
Removable Storage Device: 64GB PNY USB Flash Drive	PNY	P-FD64GTBOP-GE
eLect Administration Access Machine		
Dell Latitude E5450/5450	Dell	E5450
Cat6 Ethernet Cable 10'	N/A	N/A
Central Scan Imaging Server		
SuperMicro SC813MTQ-R400CB	SuperMicro	SC813MTQ-R400CB

Table 3-2. Voting System Equipment *(continued)*

Component	Manufacturer	Model #
APC Smart-UPS 1000 Watts/1500VA LCD 230V	APC	SMC1500
Cat6 Ethernet Cable 10'	N/A	N/A
Monitor Dell SE2416HX 23.8" Screen LED-Lit IPS Monitor	Dell	SE2416HX
Keyboard	Logitech	MK120
Mouse	Logitech	MK120
MPSM		
Dell Latitude E5450/5450	Dell	E5450
Removable Storage Device: 64GB PNY USB Flash Drive	PNY	P-FD64GTBOP-GE
CSP-4020 Laptop Security Bracket	Computer Security Products, Inc	CSP-4020
Eaton 5S700	Eaton	5S700
NETGEAR ProSAFE 16-Port Gigabit Ethernet Switch (GS116)	Netgear	GS116NA
Tripp-Lite 6 outlet Surge Protector, Model ISOBAR6ULTRA	Tripp-Lite	ISOBAR6ULTRA
Cat6 Ethernet Cable 10'	N/A	N/A
EBM		
Dell Venue Pro 11 Model 5130	Dell	5130Pro
Dell Venue 11 Pro POS Stand Enclosure	Dell	IBS-002-1004
Everyone Counts Activation Token Tray 001	Everyone Counts	1.00
Taousa Universal LED Spotlight	TaoUSA	B013U47A5A
J5Create: USB 3.0 Gigabit Ethernet and 3-port Hub	J5Create	JUH470
1 ft Extension USB Blue Right Angle USB 3.0 Type A Male to Female Adapt	Smays	GAZEWALL19810035
6 ft 3.5mm headphone extension cable	iMBAPrice	iMBA-PS-06MF
Canon PIXMA iP110	Canon	iP110
Tripp-Lite 6 outlet Surge Protector	Tripp-Lite	ISOBAR6ULTRA
Cat6 Ethernet Cable 10'	N/A	N/A
EBM-Accessibility		
Storm Interface EZ05-222013 Switch, Keypad	Storm Interface	EZ05-222013
Origin Instruments Sip/Puff Breeze with Headset USB Interface	Origin Instruments	Breeze
Koss KPH7 On-Ear Headphones	Koss	KPH7

Table 3-2. Voting System Equipment *(continued)*

Component	Manufacturer	Model #
Ballot Bag		
ElectionSource BA-51 Provisional Ballot Bag	Election Source	BA-51
Central Scanning Scanner		
Kodak i4250	Kodak	i4250
Kodak i3400	Kodak	i3400
Kodak i2820	Kodak	i2820
APC Smart-UPS 1000 Watts/1500VA LCD 230V	APC	SMC1500
Ballot Box		
Pak-Flat Fortress-EC 1.0	PakFlatt	1.0
Kodak Scan Station 730EX	Kodak	730EX
Eaton 5S700	Eaton	5S700
Shielded Cat6 Ethernet Cable 50'	N/A	N/A

3.3 Test Materials

This subsection lists all test materials required for the performance of the test campaign.

Table 3-3. Test Materials

Test Material	Product Number
12-foot Ethernet cables	common
2-foot Ethernet cables	common
5-foot Ethernet cables	common
1-foot Right Angle USB Cable	BOOKVE04VU
Trond Tablet and smart phone stand	A1
ballot box scanner power reset keys (PURSHO one plus one iPhone Sim Card Tray Open Eject Pin)	X000TBPQSR
64 GB PNY USBs	P-FD64GTBOP-GE
Venue 11 24W AC adapter	Dell # 492-BBNH
19-inch Election Source Security Sleeve	SKU: MI-458-B
Panduit RJ45 Lockout device	PSLDCJB
Panduit RJ45 Lock-in device	PSLDCPL
XTRAGUARD™ Safety Lock Plug Covers	TBD
Hammermill 8.5x14 28lb paper (20lb- 28lb)	102475
Hammermill 8.5x11 20lb paper (20lb- 28lb)	122408

Table 3-3. Test Materials *(continued)*

Test Material	Product Number
Office Depot 11x17 20lb paper (20lb-28lb)	676-579
Papermate InkJoy 300 Ballpoint Pens Black 0.7mm	1766482
Bic Velocity Retractable Gel Pens Black 0.7mm	31563
Pilot Precise V7 Rolling Ball Point Pens Black 0.7mm	26020
Pakflatt Envoseal Security Ties, Plastic	Posigrip
Tamper Evident Security Label Seals	SE-35R
Cannon Color Printer Cartridge	36
Cannon Black Printer Cartridge	35
HamiltonBuhl HygenX Sanitary Headphone Covers for On Ear Headsets	TBD
Cleaning Supplies	TBD

3.4 Deliverable Materials

This subsection lists all materials delivered as part of the voting system to the users.

Table 3-4. Deliverable Materials

Deliverable	Version	Description
<i>TBD</i>	<i>TBD</i>	<i>TBD</i>

4.0 Test Specifications

Certification testing of the eLect Quad Audit v.4.3.0 submitted for evaluation will be performed to ensure the applicable requirements of the EAC 2015 VVSG 1.1 and the EAC Testing and Certification Program Manual are met. Additionally, all EAC Request for Interpretations (RFI) and Notices of Clarification (NOC) relevant to the system under test will be incorporated in the test campaign. A complete listing of the EAC RFIs and NOCs is available on the EAC website.

4.1 Requirements

To evaluate the eLect Quad Audit v.4.3.0 test requirements, each section of the EAC 2015 VVSG 1.1 will be analyzed to determine the applicable tests. The EAC 2015 VVSG 1.1 Volume I Sections, along with the strategy of evaluation, are described below:

Section 2: Functional Requirements

The requirements in this section shall be tested during the FCA and System Integration Test. This evaluation will utilize baseline test cases as well as specifically designed test cases and will include predefined election definitions for the input data.

Section 3: Usability and Accessibility Requirements

The requirements in this section shall be tested during the Usability and Accessibility Testing. This evaluation will utilize baseline test cases as well as specifically designed test cases and will include predefined election definitions for the input data.

Section 4: Hardware Requirements

The requirements in this section shall be tested and/or evaluated by personnel verified by Pro V&V to be qualified to perform the testing.

Section 5: Software Requirements

The requirements in this section shall be tested utilizing a combination of review and functional testing during the Source Code Review, TDP Review, and FCA.

Section 6: Telecommunications Requirements

The requirements in this section shall be tested utilizing baseline test cases as well as specifically designed test cases.

Section 7: Security Requirements

The requirements in this section shall be tested during the Source Code Review, Security Tests, and FCA.

Section 8: Quality Assurance and Configuration Management

The requirements in this section shall be tested throughout the test campaign. This testing will utilize a TDP Review in conjunction with the Source Code Review and PCA to determine compliance to the EAC 2015 VVSG 1.1 requirements and the requirements stated in the Everyone Counts technical documentation. The review of the Quality Assurance and Configuration Management documentation will focus on Everyone Counts' adherence to its stated QA and CM processes.

Throughout the test campaign, Pro V&V personnel shall maintain a test log identifying the system and equipment under test and any records of deviations to the test plan along with the rationale for performing the deviations. Pro V&V shall also utilize an internal bug tracking system to record and track all issues and/or discrepancies noted during the test campaign.

4.1.1 Mapping of Requirements to Equipment Type and Features

This information shall be included in the EAC online matrix tool (VRT).

4.1.2 Rationale NA Requirements

All EAC 2015 VVSG 1.1 requirements, with the exceptions listed below, will be evaluated as part of this test campaign.

- Volume I, Section 7.6 (Use of Public Networks)
- Volume I, Section 7.7 (Wireless Communications)
- Volume I, Section 7.8 (Voter Verifiable Paper Audit Trail Requirements)

The rationale for not evaluating the eLect Quad Audit v.4.3.0 to the indicated sections is described in following table. Specific requirements that are excluded from this test campaign are identified in the EAC online matrix tool.

Table 4-1. Not Applicable Requirements

EAC 2015 VVSG Version 1.1 Volume I, Section	Rationale for 'Not Applicable'
7.6	This system does not support transmission over public networks.
7.7	No wireless technology is utilized in this system.
7.8	This system does not contain a Voter Verifiable Paper Audit Trail (VVPAT).

4.2 Hardware Configuration and Design

The eLect Quad Audit v.4.3.0 system operates in two environments/locations: the central location and the polling place. Each location type utilizes a distinct hardware set. Each location incorporates servers or laptops containing versions of eLect Quad Audit and associated election settings/data.

The following six devices run different functions within the voting system:

- **Central Server**
The Central Server at the central location is the primary system device and runs eLect Quad Audit (Voting) and eLect Administration. All official tabulation occurs on the Central Server. The Central Server is comprised of COTS hardware and is connected to COTS UPS devices for soft shutdown during power interruptions.
- **Central Scan Imaging Server**
The Central Scan Imaging Server is a COTS rack server attached to the Central Server and is used solely for software image processing of centrally scanned mail-in ballots.
- **Master Poll Station Machine (MPSM)**
MPSM laptops are located at the polling place and contain the same version of the election configuration, but are not configured with eLect Administration; therefore, they do not contain the full eLect Quad Audit voting system.
- **Air-gapped Encryption/Decryption Device**
An air-gapped COTS laptop running eLect Security Suite only on Ubuntu desktop is used to generate encryption key pairs during the pre-election setup stage and used to decrypt vote data during post-election processing
- **eLect Administration Access Machine**
The eLect Administration Access Machine is the COTS laptop that provides access to the eLect Administration and is the user interface for all election management functionality in the eLect Quad Audit voting system.
- **Local Network Switch**
The Local Network Switch is a COTS network switch that provides Ethernet communications between the Central Server, Central Scan Imaging Server and the eLect Administration Access Machine.

Due to the fact that the eLect Quad Audit v.4.3.0 consists primarily of COTS hardware, various tests have been waived for this test program. Pro V&V and the EAC have performed an evaluation to determine the applicable hardware tests. The results of this evaluation are included in Table 4-2.

4.3 Software System Functions

The eLect Quad Audit v.4.3.0 system includes the following proprietary software components:

- eLect Quad Audit
The eLect Quad Audit voting system is the platform that provides election administrators with the tools to manage elections.
- eLect Administration Dashboard
eLect Administration is the user interface for the Admin User. It contains various system modules for election creation and management.
- Poll Station Management Console
The eLect Poll Station Management Console is the user interface that is accessed through the poll station EBM to the poll worker.
- eLect Central Scanning
eLect Central Scanning is incorporated within eLect Administration.
- eLect Quad Audit
eLect Quad Audit is the core software module of the voting system.
- eLect Security Suite
eLect Security Suite is a utility application that provides encryption and decryption services.

The eLect Quad Audit v.4.3.0 system also includes modified and unmodified third-party components, and external library items, as previously detailed in Table 3-1.

4.4 Test Case Design

Test cases are designed based on the manufacturer's design specifications and the relevant technical requirements set forth by the VVSG. Test cases shall be examined based on the following aspects of the voting system:

- Hardware qualitative examination design
- Hardware environmental test case design
- Software module test case design and data
- Software functional test case design
- System level test case design

Test cases shall provide information regarding the sequence of actions to be performed for the execution of a test, the requirements being met, the test objective, test configuration, equipment needed, special requirements, assumptions, and pass/fail criteria. Once the test cases are finalized, they will be validated and published for use in the test campaign. The validation of the test case will be accomplished by Technical Review and Approval. This validation will include the following: confirmation of adequate test coverage of all requirements; confirmation that test case results are not ambiguous and gave objective pass/fail criteria; and conformation that any automated test suites will produce valid results.

4.4.1 Hardware Qualitative Examination Design

No previous examinations have been performed on the eLect Quad Audit v.4.3.0. In order to determine the appropriate tests to be performed during the test campaign, Pro V&V compared the performance characteristics specified by Volume I, Chapter 2 of the guidelines concerning the requirements for overall system capabilities, pre-voting functions, voting functions, and post-voting functions. Based on this evaluation and the guidance of the EAC, Pro V&V has determined that the following tests must be performed:

Table 4-2. Hardware Testing Analysis

Hardware Test	System Component			
	EBM	Ballot Box	Central Count	MPSM
Electrical Supply	X	X	X	X
Electrical Power Disturbance	X ₁	X	---6	TBD ₉
Electrical Fast Transient	X ₁	X	---6	TBD ₉
Lightning Surge	X ₁	X	---6	TBD ₉
Electrostatic Disruption	X ₂	X	---6	X _{8/10}
Electromagnetic Emissions	X ₂	X	---6	X _{8/10}
Electromagnetic Susceptibility	X ₂	X	---6	X _{8/10}
Conducted RF Immunity	X ₂	X	---	X _{8/10}
Magnetic Fields Immunity	X ₂	X	---	X _{8/10}
Non-Operational Low Temp	TBD ₃	TBD ₃	---6	---3
Non-Operational High Temp	TBD ₃	TBD ₃	---6	---3
Non-Operational Humidity	X ₅	X ₅	---6	---8
Operational Low Temp	X ₃	X ₃	---6	---8
Operational High Temp	X ₃	X ₃	---6	---8
Operational Humidity	X	X	---6	---8
Bench Handling	X ₄	X ₄	X ₄	X ₄
Vibration	X ₄	X ₄	X ₄	X ₄
Product Safety	X ₇	X ₇	X ₇	X ₇

1 Terminal only with UPS, testing focused on interaction with printer outside of power source, no data present

2 EBM with no shoe shine mode, unit will only be powered on connected to printer with audio playing

3 Dependent on RFI

4 COTS Shipped as provided by manufacturer

5 COTS Terminal tested in operational mode

6 COTS Central Count outside of scope

7 VSTL to verify either UL or OSHA certified

8 COTS Back Office Laptop

9 EAC Awaiting Analysis

10 Critical to system per EAC

4.4.1.1 Mapping of Requirements to Specific Interfaces

This information shall be contained in the EAC online matrix tool.

4.4.2 Hardware Environmental Test Case Design

No previous examinations have been performed on the eLect Quad Audit v.4.3.0. The voting system hardware shall be subjected to the tests specified in Table 4.4.1. Testing will be performed by personnel verified by Pro V&V to be qualified to perform the test. Pro V&V will utilize a third-party test facility for performance of the electrical and environmental tests. All pre/post-tests shall be conducted by Pro V&V personnel.

4.4.3 Software Module Test Case Design and Data

Pro V&V shall review the manufacturer's program analysis, documentation, and module test case design and shall evaluate the test cases for each module with respect to flow control parameters and entry/exit data. As needed, Pro V&V shall design additional test cases to satisfy the coverage criteria specified in Volume II, Section 7.2.1.

Component Level Testing will be implemented during the FCA for each component and subcomponent. During the Source Code Review, Compliance Builds, and Security Testing, Pro V&V will utilize limited structural-based techniques (white-box testing). Additionally, specification-based techniques (black-box testing) will be utilized for the individual software components.

Pro V&V shall define the expected result for each test and the ACCEPT/REJECT criteria for certification. If the system performs as expected, the results will be accepted. If the system does not perform as expected, an analysis will be performed to determine the cause. The test will be repeated in an attempt to reproduce the results. If the failure can be reproduced and the expected results are not met, the system will have failed the test. If the results cannot be reproduced, the test will continue. All errors encountered will be documented and tracked through resolution.

4.4.4 Software Functional Test Case Design and Data

Pro V&V shall review the manufacturer-submitted test plans and data to verify that the individual performance requirements specified in the EAC 2015 VVSG 1.1 and the TDP are reflected in the software. As part of this process, Pro V&V shall review the manufacturer's test case design and prepare a detailed matrix of system functions and the test cases that exercise them. Pro V&V shall also prepare a test procedure describing all test ballots, operator procedures, and the data content of output reports. Pro V&V shall define abnormal input data and operator actions and design test cases to verify that the system is able to handle and recover from these abnormal conditions. During this review, emphasis shall be placed on those functions where the manufacturer data on module development reflects significant debugging problems, and on functional tests that resulted in high error rates.

Pro V&V shall define the expected result for each test and the ACCEPT/REJECT criteria for certification. If the system performs as expected, the results will be accepted. If the system does not perform as expected, an analysis will be performed to determine the cause. The test will be repeated in an attempt to reproduce the results. If the failure can be reproduced and the expected results are not met, the system will have failed the test. If the results cannot be reproduced, the test will continue. All errors encountered will be documented and tracked through resolution.

4.4.5 System-Level Test Case Design

System Level testing will be implemented to evaluate the complete system. This testing will include all proprietary components (software, hardware, and peripherals) and COTS components (software, hardware, and peripherals) in a configuration of the system's intended use. For software system tests, the tests shall be designed according to the stated design objective without consideration of its functional specification. The system level hardware and software test cases shall be prepared independently to assess the response of the hardware and software to a range of conditions. These tests include: Volume, Stress, Usability, Accessibility, Security, Performance, and Recovery.

4.5 Security Functions

The objective of the Security Testing is to evaluate the effectiveness of the voting system in detecting, preventing, recording, reporting, and recovering from security threats. To evaluate the integrity of the system, Pro V&V shall develop specifically designed test cases in an attempt to defeat the access controls and security measures documented in the system TDP. A threat matrix shall be created to determine the risks and vulnerabilities. An evaluation of the system shall be accomplished by utilizing a combination of functional testing, source code review, and Fortify SCA. All findings will be reported to the EAC and Everyone Counts.

4.6 TDP Evaluation

In order to determine full compliance with the EAC 2015 VVSG 1.1, three phases of TDP review shall be conducted:

- **Initial TDP Review:** The first review is performed to determine whether the TDP submitted is complete enough to perform TDP review. This is an abbreviated review. Each document is read to determine whether it provides enough description of the submitted voting system components and whether it at least generically addresses VVSG requirements. The results of the review are used in determining contractual requirements for the test campaign.
- **Compliance Review:** This review is conducted on a document-by-document basis to determine if every regulatory, state, or manufacturer-stated requirement has been met based on the context of each requirement. This review does not address consistency or completeness of documents. The review is more complex than the initial TDP review. Results of the review of each document are entered on the TDP Review Checklist and are reported to the manufacturer for disposition of any anomalies. This process is ongoing until all anomalies are resolved. Any revised documents during the TDP review process are compared with the previous document revision to determine changes made, and the document is re-reviewed to determine whether subject requirements have been met.
- **Consistency/Completeness Review:** The third TDP review is completed after the review for compliance has been performed (the Consistency/Completeness TDP Review may overlap the Compliance Review in part). This review is to ensure the information included in the TDP documents is consistent across documents, especially in component naming, software and firmware versioning, and the hardware, software, and firmware included with the voting system submitted for testing. Any revisions to a document during the TDP review process which affect other documents must also be revised. As with the other TDP reviews, the TDP Review Checklist is utilized to report any anomalies to the manufacturer for resolution, if required. The TDP review continues until all anomalies have been satisfactorily resolved.

A listing of all documents contained in the eLect Quad Audit v.4.3.0 TDP is provided in Table 4-3.

Table 4-3. TDP Deliverable Materials

Title	Document Rev.	Date
DOC-001 EAC VVSG 1.1 TDP Documents	1.23	2/22/2016
DOC-009 eLect Quad Audit 4.3.0 Deployment & Implementation Schedule	none	none
DS-028 Implementation Statement	1.9	1/15/2016
DS-1710 System Overview	1.0	5/25/2016
DS-030 Software Design Specifications	1.5	1/22/2016
DS-030A Software Design Specifications Appendices	2	2/3/2016
DS-032 System Functionality Design	1.5	1/21/2016
DS-033 System Maintenance, Personnel and Training Manual	1.3	2/12/2016
SP-1805 System Hardware Specifications	1.0	5/25/2016
DS-035 Audit Event Logging	1.1	10/27/2015
OP-012 Systems Operations Procedures	1.5	2/19/2016
OP-014 Building an Air-Gapped Machine with eLect Security Suite	1.2	11/21/2015
OP-015 Deploying the Master Poll Station Machine	1.6	2/19/2016
OP-016 Deploying the Central Server	1.3	11/25/2015
OP-017 Pre-Poll Station Setup at Central Office	1.4	11/23/2015
QA-022 Everyone Counts Security Policy	1.1	10/27/2015
QA-024 Quality Assurance	1.3	1/6/2016
QA-025 Configuration Management Plan	1.3	12/7/2015
QA-026 System Test Specifications	1.3	1/27/2016
QA-026A Limits Test Report	none	e-date 1/28/16
QA-027 Security Policy	1.2	12/3/2015
SC-023 System Security Specifications	1.6	1/15/2016
SC-038 Security Manual for System Users	1.0	1/18/2016
ST-002 System Setup Overview	1.6	2/3/2016
ST-003 Linux Server Build Instructions, Source Code, and ISO	1.3	11/19/2015
ST-004 Linux Server Instructions for Secondary Installations	1.3	11/19/2015
ST-005 eLect Administration Access Machine Setup	1.13	2/3/2016
ST-006 Dell Venue 11 BMD Setup Instructions	1.9	1/20/2016
ST-007 Ballot Box Setup Instructions	1.9	2/3/2016

Table 4-3. TDP Deliverable Materials *(continued)*

Title	Document Rev.	Date
ST-008 Building the Central Scan ImagingServer on Supermicro	1.1	10/27/2015
ST-008a Building the Central Scan Imaging and Transfer Services Files	1.2.0	11/12/2015
ST-008 Building the Central Scan Imaging and Transfer Services Files	1.6	2/19/2016
ST-009 Building a Central Scan Imaging Server on Supermicro	1.6	2/19/2016
ST-010 Installing Ubuntu 12.04	1.4	11/25/2015
ST-011 Imagine Dell Venue 11 Tablet	1.5	1/14/2016
ST-014 Building an Air-Gapped Machine with Elect Security Suite	1.4	2/19/2016
ST-016 Deploying the Central Server	1.9	2/19/2016
ST-037 Dell Venue XPS 18 Setup Instructions	1.0	12/9/2015
UG-018 eLect Administration User Guide	1.12	2/5/2016
UG-019 eLect Security Suite User Guide	1.5	1/28/2016
UG-21 Opening, Running, and Closing the Poll Station	1.11	2/3/2016
UG-40 Consumables for Elect Quad Audit v.4.3.0	1.0	1/13/2016
Usability Test Report of eLect Quad Audit v.4.3.0	none	11/2/2015
APC by Schneider Electric Smart-UPS Uninterruptible Power Supply User's Guide	none	03/2013
APC by Schneider Electric Smart-UPS Uninterruptible Power Supply Declaration of Conformity	none	2015
Canon iP110 Series User's Guide	none	none
Canon PIXMA iP110 Getting Started Guide	none	none
Dell Latitude 14 5000 Series Models E5450/5450 Specifications Sheet	none	none
Dell Latitude 14 5000 Series Models E5450/5450 User's Guide	none	none
Dell Venue 11 Pro POS Stand Enclosure User's Guide	none	none
Dell Venue Pro 11 7130-7139 User's Guide	A01	2014-06
Eaton 5S 550/700 User's Guide	none	none
j5create JUH340 USB 3.0 4-port Mini Hub User's Guide	none	none

Table 4-3. TDP Deliverable Materials *(continued)*

Title	Document Rev.	Date
j5create JU470 USB 3.0 Gigabit Ethernet and 3-Port HUB User's Guide	none	none
Kodak i2400-i2600-i2800 Scanners Reference Guide	none	none
Kodak i2400-i2600-i2800 Scanners Scanning Setup Guide for ISIS Applications	none	November 2012
Kodak i2400-i2600-i2800 Scanners User's Guide for TWAIN Applications	none	November 2012
Kodak i2400-i2600-i2800 Scanners User's Guide	none	7/1/2014
Kodak i3000 Series Scanners User's Guide for ISIS Applications	none	9/1/2013
Kodak i3000 Series Scanners User's Guide for TWAIN Applications	none	October 2012
Kodak i3200-i3400-i3450 Scanners User's Guide	none	December 2013
Kodak i3200-i3400-i3450 Scanners Reference Guide	none	none
Kodak i4000 Plus Series Scanners Brochure	none	none
Kodak i4000 Plus Series Scanners Reference Guide	none	none
Kodak i4000 Plus Series Scanners User's Guide for ISIS Applications	none	August 2013
Kodak i4000 Plus Series Scanners Scanning Setup Guide for TWAIN Applications	none	August 2013
Kodak i4000 Plus Series Scanners User's Guide	none	August 2013
Kodak i4000 Series Scanners Brochure	none	10/13
Kodak Scan Station 700-710-720ex-730ex Network Scanners end of life plan	none	none
Kodak Scan Station 730EX Product Specifications	none	none
KOSS KPH7 Colors On-Ear Headphones Product Specifications	none	none
Memorex Slim External DVD Writer User's Guide	none	none

Table 4-3. TDP Deliverable Materials *(continued)*

Title	Document Rev.	Date
Netgear ProSAFE 16-port Gigabit Desktop Switch GS116v2 Data Sheet	none	none
Origin Instruments USB Sip-Puff Switch Model BZ2 User's Guide	none	08212014
Origin Instruments Multi-user Sip-Puff Switch User's Guide	none	none
Origin Instruments Sip-Puff Switch User Guide	none	2013
PNY 64GB Turbo USB 3.0 Flash Drive Product Specifications	none	none
PURSHO One Plus One Sim Card Tray Eject Pin Key Tool Product Specifications	none	none
Storm EZ-Access Keypads User's Guide	1	10/1/2008
Supero SC813M Chassis Series User's Guide	1.0a	none
Tripp-Lite Isobar 6-Outlet A/V Surge Protector User's Guide	none	none
Dynamsoft Dynamic web TWAIN Unlimited License Agreement		
OpenText OEM Agreement	none	May 28, 2015
Logi Analytics, Inc. Master Software License Agreement	none	December 20, 2013
Dynamsoft purchase invoice		March 11, 2015

4.7 Source Code Review

Pro V&V will review the submitted source code to the EAC 2015 VVSG 1.1 and the manufacturer-submitted coding standards. Prior to initiating the software review, Pro V&V shall verify that the submitted documentation is sufficient to enable: (1) a review of the source code and (2) Pro V&V to design and conduct tests at every level of the software structure to verify that design specifications and performance guidelines are met.

4.8 QA & CM System Review

The Everyone Counts Quality and Configuration Management Manual shall be reviewed for its fulfillment of Volume I, Section 8.1.a and the requirements specified in Volume II, Section 2.1. The requirements for these sections establish the quality assurance and configuration standards for voting systems to which manufacturers must conform. The requirements also require voting system manufacturers to implement a quality assurance and configuration management program that is conformant with recognized ISO standards.

As part of the review process, the Everyone Counts TDP documents will be reviewed to determine if the stated policies are being followed.

5.0 Test Data

The following subsections provide information concerning test data recording, criteria, and reduction.

5.1 Test Data Recording

All equipment utilized for test data recording shall be identified in the test data package. The output test data shall be recorded in an appropriate manner as to allow for data analysis. For source code and TDP reviews, results shall be compiled in reports and submitted to Everyone Counts for resolution.

5.2 Test Data Criteria

The eLect Quad Audit v.4.3.0 shall be evaluated against all applicable requirements contained in the EAC 2015 VVSG 1.1. The acceptable range for system performance and the expected results for each test case shall be derived from the manufacturer-submitted technical documentation and the EAC 2015 VVSG 1.1.

5.3 Test Data Reduction

Test data shall be processed and recorded in the test log book and the relevant Test Cases.

6.0 Test Procedure and Conditions

The following subsections detail the facility requirements, test setup conditions, and sequence of testing.

6.1 Facility Requirements

Unless otherwise annotated, all testing shall be conducted at the Pro V&V test facility located in Huntsville, AL. Hardware and electrical testing will be performed at a third-party test facility under personnel verified by Pro V&V to perform the test.

Unless otherwise specified herein, testing shall be performed at standard ambient conditions.

6.2 Test Setup

All voting system equipment shall be received and documented using Pro V&V proper QA procedures. Upon receipt of all hardware, an inspection will be performed to verify that the equipment received is free from obvious signs of damage and/or degradation that may have occurred during transit. If present, this damage shall be recorded, photographed, and reported to the Everyone Counts Representative. Additionally, a comparison shall be made between the recorded serial numbers/part numbers and those listed on shipper's manifest and any discrepancies shall be reported to the Everyone Counts Representative. TDP items and all source code received shall be inventoried and maintained by Pro V&V during the test campaign.

During test performance, the system shall be configured as would be for normal field use. This includes connecting all supporting equipment and peripherals.

6.3 Test Sequence

The eLect Quad Audit v.4.3.0 will be evaluated against all applicable requirements in the EAC 2015 VVSG 1.1. There is no required sequence for test performance.

7.0 Proprietary Data

All data and documentation considered by the manufacturer to be proprietary will be identified and documented in an independent submission along with a Notice of Protected Information.

Attachment A – Project Schedule

Task Name	Start Date	End Date	Duration	Predecessors
TDP	06/06/16	10/28/16	98d	
Initial Review	06/06/16	06/13/16	5d	
Compliance Review	06/13/16	10/25/16	90d	3
Final review	10/26/16	10/28/16	3d	4
Test Plan	06/06/16	08/05/16	43d	
Test Plan Creation	06/06/16	06/15/16	8d	
Vendor Review & Comments	06/16/16	06/17/16	2d	7
EAC Review	06/20/16	07/19/16	20d	8
Test Plan Comment Review & Update	07/20/16	07/21/16	2d	9
EAC Resubmission Review	07/22/16	08/04/16	10d	10
EAC Approved Test Plan	08/05/16	08/05/16	1d	11
Source Code	06/06/16	06/20/16	11d	
Source Code Delivered	06/06/16	06/06/16	1d	
Source Code Review	06/07/16	06/16/16	5d	14
Source Code Re-Review	06/14/16	06/15/16	2d	15
Document Review	06/16/16	06/17/16	2d	16
Compliance Build	06/20/16	06/20/16	1d	17
System Delivery & Setup	06/06/16	06/28/16	17d	
Equipment Delivered	06/06/16	06/06/16	1d	
PCA	06/07/16	06/07/16	1d	20
System Loads & Hardening	06/21/16	06/27/16	5d	18
Readiness For Testing	06/28/16	06/28/16	1d	22
Hardware Testing	06/29/16	07/08/16	8d	
Electrical Testing	06/29/16	06/30/16	2d	23
Environmental Testing	06/30/16	07/08/16	6d	25
System Level Testing	07/11/16	10/28/16	73d	
FCA	07/11/16	08/09/16	20d	26
Telecommunications	08/15/16	08/30/16	10d	28
Security	08/31/16	09/20/16	15d	29
Usability	09/21/16	09/22/16	2d	30
Accessibility	09/23/16	09/26/16	2d	31
Volume & Stress (System Limits)	09/27/16	10/03/16	5d	32
Pen Test (Multiple Colors)	10/04/16	10/05/16	2d	33
Maintainability	10/06/16	10/10/16	3d	34
Accuracy	10/11/16	10/13/16	3d	35
Regression Testing	10/14/16	10/19/16	4d	36
Trusted Build	10/20/16	10/21/16	2d	37
System Integration	10/24/16	10/28/16	5d	38
Test Report	10/20/16	12/22/16	46d	
Test Report Creation	10/20/16	11/02/16	10d	37
Vendor Review & Comments	11/03/16	11/04/16	2d	41
EAC Review	11/07/16	12/02/16	20d	42
Test Report Comment Review & Update	12/05/16	12/07/16	3d	43
EAC Resubmission Review	12/08/16	12/21/16	10d	44
EAC Approved Test Report	12/21/16	12/22/16	1d	45